## Total Hip Arthroplasty Stems Implanted through a Direct Anterior Approach have Higher Anteversion than those Implanted through a Posterior Approach

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INTRODUCTION: Surgical approach has been reported to influence component positioning in total hip arthroplasty THA. However, this has not been investigated across many patients, surgeons, and stem designs. The purpose of this study was to investigate the influence of surgical approach on femoral stem version in THA.

METHODS: This was a retrospective review of 830 THAs in 830 patients that had both preoperative and postoperative CT scans within the CorinRegistry. All patients underwent staged bilateral THAs and received CT-based 3D planning on both sides. Stem version was measured in the second CT-scan and compared to the native neck axis measured in the first CT-scan, using the posterior condyles as the reference for both. Cases were performed by 104 surgeons using either a direct anterior (DAA, n=303) or posterior (PA, n=527) approach and one of four stem designs: quadrangular taper, calcar-guided short stem, flat taper, fit-and-fill. Sub-analyses investigated changes in version for low ( $\leq$ 5°), neutral (5-25°) and high ( $\geq$ 25°) native version subgroups and for the different implant types.

RESULTS: Native version was not different between approaches (DAA =  $12.6^{\circ}$ , PA =  $13.6^{\circ}$ , p = 0.16). Overall, DAA stems were more anteverted relative to the native neck axis vs PA stems ( $5.9^{\circ}$  vs  $1.4^{\circ}$ , p<0.001), figure 1. This trend persisted in hips with high native version ( $3.2^{\circ}$  vs  $-5.3^{\circ}$ , p<0.01) and neutral native version ( $5.3^{\circ}$  vs  $1.3^{\circ}$ , p<0.001), but did not reach significance in the low native version subgroup ( $8.9^{\circ}$  vs  $5.9^{\circ}$ , p=0.13), figure 2. Quadrangular taper, calcarguided, and flat taper stem types had significantly more anteversion than native for DAA, while no differences were found for PA, figure 3.

## DISCUSSION AND CONCLUSION:

Stems implanted with a direct anterior approach had more anteversion than those implanted with a posterior approach. This may be due in part to soft tissues pushing broaching instrumentation anterior and lack of using the vertical tibia as a reference of the posterior femoral condules in DAA.

